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ABSTRACT

Students beginning a freshman composition class tend to regard writing as an editing process rather than as a process which encompasses intelligence, character, and humanity. Helping students understand and master heuristic procedures on the way to developing composition skills can be facilitated by the use of the game Twenty Questions to learn the processes of classifying, sequencing, and questioning. As the game is played, students keep track of questions asked and the responses to each. They analyze them, categorize them, check the significance of sequence for each one, and begin to discover that careful questioning can help them arrive at the correct answer. The rules for this game, including group decisions on the questions to be asked, help develop problem-solving ability and promote the use of brain-storming. Students learn, too, the value of intuition beyond mechanical questioning. All of this experience helps promote adequate initiation to most heuristic procedures and helps the students discover the total involvement necessary for communication. (TJ)

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Animal, Vegetable, Mineral: A Method for Introducing Heuristics

Introduction

I begin my opening freshman composition classes with a simple experiment. After distributing index cards and requesting the usual information -- name, major, job, special interests -- I ask my students to mark plus or minus in answer to the following question: "What do you think of your writing ability?" Invariably, almost everyone marks minus. I do not think this is unusual, but I do think it has some unusual significance.

First of all, students do not naturally put themselves down about important matters. I do not think, for example, that, if I asked them to assess their character, humanity, and intelligence, they would invariably mark minus. I surmise that on the question of writing ability my students do not really believe they are acknowledging a serious deficiency (I grant the possibility for other motives, but I think the responses share the same feature regardless of any other motives). What accounts for this? I believe my students view writing in a very narrow sense. To use "our" term they see it primarily as a matter of editing. To acknowledge "minus" writing ability is not to acknowledge any great limitation.

I complete this experiment by explaining that if they mark minus at the end of the semester they are saying a great deal about themselves. And if they understand the thrust of the course they are acknowledging a severe limitation. Why? Because good "writing" is not a matter of editing, but

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involves a very complicated process in which one's intelligence, character, and, yes, even humanity, is at stake. None of us, I think, would mark plus or minus on all three counts, but neither with ease would we mark minus. I do not want my students to do so with ease either.

But what has all this to do with introducing heuristic procedures? Most of this paper addresses the problem of introducing such procedures to students who have never considered this as part of the writing process. Since including heuristic procedures, I felt that some technique was needed to bridge the prewriting gap created by the many heuristic procedures available (e.g. Burke's Pentad, Larson's series of questions, the tagmemic system of Young, Becker, and Pike) and my students lack of experience in this area. What my experiment suggests is that the problem of introducing heuristics can best occur if it is understood as part of a larger problem -- the failure of students (and I might add the public that is clamoring for a return to the "Basics") to see writing as a process -- a process that encompasses intelligence, character, and humanity.

The Problem.

I encountered difficulties in helping my students understand and master heuristic procedures. I also became aware from talking with other teachers that this was not a problem unique to me. Many teachers have students who are overwhelmed by matrices, systems, and topics. The students have trouble in understanding the nature of problem solving and exploration. Furthermore, they memorize heuristic procedures but seldom master them.

It seemed to me that I needed to overcome this difficulty by first introducing students to three basic processes that are fundamental to heuristic procedures. These three processes are classifying, sequencing, and questioning.

Previous attempts to introduce heuristic procedures assumed too much on the part of my students (especially since they normally do not view writing as a process). Previous attempts assumed an understanding, for example, of classifying, sequencing, and questioning.

A Solution.

What I needed at this stage was a strategy that introduced all three processes in an engaging and thorough fashion. I chose an adaptation of a game called Twenty Questions (20 Q). It may for some go by a different name. The object of the game is to guess what someone is thinking (the unknown) by asking them questions to which only "yes" or "no" can be answered. The object must be discovered within 20 questions. The value of using this game to introduce heuristic procedures is that to successfully play the game the students must become aware of classifying, sequencing, and questioning. Secondly, the game is a closed system of inquiry, allowing for a detailed view of a heuristic system. It is self-contained, the object of their search is not complex, and it is a miniature model of more elaborate procedures. Finally, by putting the strategy in the form of a game the students are better motivated and hopefully anticipate not only the game but the whole composing process.

The Method

The Game.

I begin the game of 20Q without giving my students any prior warning. I explain the object of the game and we begin. Their questions for the most part are disjointed, random, and imprecise -- i.e. they do not classify their questions, sequence them, or clearly state them. Either in a given time period (20 minutes) or within 20 questions, they are unable to gather enough information

to "discover" the object "hidden" in my mind.

After a few attempts some rules are added to the game. Groups are formed of four or five students. Members may discuss and suggest the kind of question to ask in each instance, and, in rotation, one of them decides the question. They write it down, raise their hands, and await my "yes" or "no" answer to their written question. They record each question for each game for future reference. I should add now the kinds of objects that are permissable. They are not abstractions (colors, virtues, concepts). They are not unusual. Since the game demonstrates only a discovery aspect (recall) of a heuristic procedure, an unknown object would never be discovered, at least not by name. Finally, they are not specific examples of the object -- RAZOR, not GILLETTE or CARTRIDGE.

The final consideration is to make the game competitive. The group which "guesses" the object with the fewest questions wins. The only hitch is that the students must not stumble on the object. When they feel they know the object they state it as a declarative sentence -- e.g. "it is a RAZOR." If they guess wrong or stumble onto the object through a question they are out of the game.

Benefits.

As I mentioned earlier 20Q serves to introduce students to the objectives of heuristic procedures. The better prepared they are to understand such procedures the better they use them. All of this promotes understanding, control, and full perception of the experience they finally will communicate about.

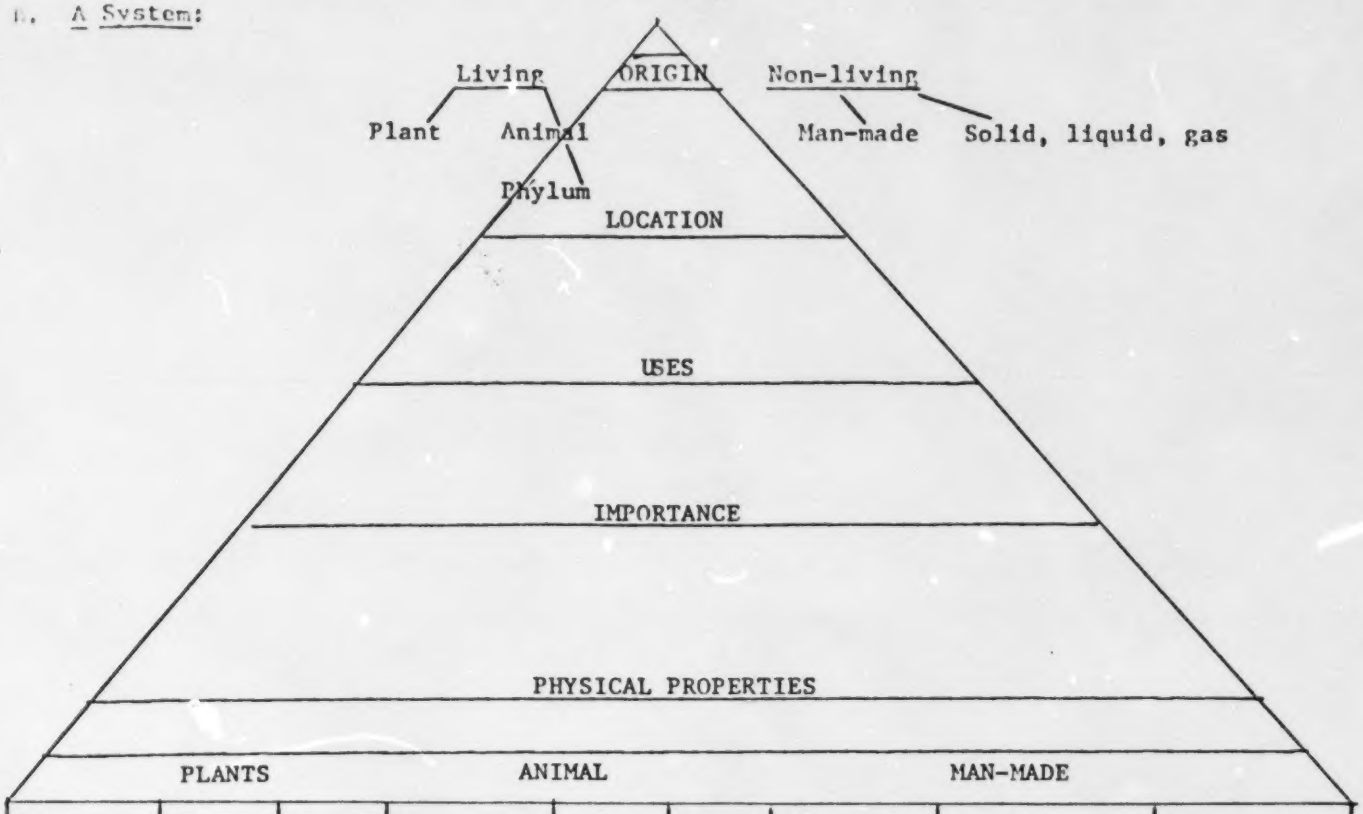
A. Learning a System:

1. Classifying -- The students keep a list of their questions. They analyze them and note if they can classify certain types of questions.

For example, "is it used in the kitchen?", or, "do students use it in school?" Such questions can be classified as use questions and quite properly could be used as a classification for generating certain kinds of questions.

2. Sequencing -- After the students have come up with four or five classes of questions, they are asked to note whether their classifications follow any sequence (usually they have been random) and whether there is a proper sequencing for these classes.
3. Questioning -- At the very heart of any heuristic procedure is questioning. Students learn the importance of precision in stating questions. For example, many times I am unable to answer yes or no to their questions. Furthermore, they learn how their questions often contain hidden assumptions (begging the question). They may ask, for example, whether a certain object is found indoors (e.g. umbrella). An umbrella can be found indoors but it is used outdoors. The question assumes the object has a unique location which it does not. Whether it has a unique location needs to be determined first (when it is used is more germane than where it is found). Following is a typical system that they evolve.

I. A System:



PLANTS			ANIMAL			MAN-MADE		
Location	Uses	Properties	Location	Uses	Properties	Location	Uses	Properties
Below Above Wild Cultivated	Food Shelter Medicinal	Large Small Color Soft Hard	Below On Above Domestic Wild	Food Power Recreation	Size Color Mammal Etc.	Indoors Outdoors On People	Who 1. Age 2. Sex	Size Color Shape Material
						Indoors 1. Particular Room 2. Etc.	Where Used When Used	Needs Power Texture Has lettering or numbering
Woods Desert Mountains Jungle Swamp Prairie			Woods Desert Mountains Jungle Swamp Prairie			Outdoors 1. Land 2. Sea 3. Air	Domestic Recreation Communication Transportation	
						On People 1. Clothing 2. Part of body	Health Entertainment Education	
							Cleans Fastens Protects Repairs Contains	

As you can see from the system each major classification contains a series of subtopics.

After developing a system we again play the game. All the groups are more effective and usually in less than half the time and questions they are able to zero in on the "answer" to the "problem". Another possible approach to developing a system is to have one group develop and use a system (from another class) and compete against a class which has not yet developed one. Later one class could teach the other.

C. Promoting Problem Solving:

Besides the keeping of journals, I ask my students to write at least one communication that involves the whole writing process. It is my belief that the best kind of writing comes from problematic situations (a method that is well developed in Rhetoric, Discovery and Change by Young, Becker, and Pike). Introducing them to the problem of discovery found in 20Q anticipates the problem solving nature of their major writing assignment. Furthermore, introducing heuristics through a problem solving game and then writing on topics stemming from problem situations anticipates some concern over discovery techniques that are not put in a creative context.

D. Using Brainstorming:

Since the students work in groups and discuss the kinds of questions they are going to ask (as well as decide on a system for playing 20Q), they become familiar with the value of brainstorming. This allows them to observe that problem solving requires more than a mechanistic approach. When they work with their major communication I also assign them to groups where they use brainstorming to complement the heuristic procedure

(the tagmemic system of Young, Becker, and Pike is usually the sytem I use).

E. Anticipating Heuristic Procedures:

It is obvious from playing 20Q that there is a great deal of room for hunches and intuitions. Often students will grasp the direction a certain line of questioning is going in, and, with few obvious clues from the system, will close in on the hidden object. Likewise, when my students work with their own problems and try to apply a heuristic procedure to them, they learn that the process is not mechanical and rigid. They realize the role of prior knowledge and experience in generating good questions and tentative solutions. Even in 20Q it is clear that good questions generated by the system depend as much on the questioneer's knowledge and experience as on the system itself. For example, if the hidden object is a rabbit the student who asks if it's a "mammal" is going to glean more information than a student who has not taken a biology course or is unfamiliar with the word mammal. As I point out to my students, a heuristic procedure is not a short-cut to problem solving skills. It does allow one to make the most of what they already know, either to generate new perspectives or to discover information, but it is no substitute for experience and knowledge. A non-reporter, for example, using a system of who, what, when, where, and why, may know from the system what is to be discovered, but only an experienced reporter may be able to successfully answer them (we discuss investigative reporting and the film All The President's Men. This point is further illustrated in the detective's system of means, motive, and opportunity.

This system generates many kinds of questions, but the experienced and knowledgeable will have the know how to generate the most profitable questions, as well as answer them (we discuss the TV series Quincey and the medical examiner's concern with means and his ability to interpret information).

No system guarantees a solution and 20Q illustrates this clearly. Some objects remain undiscovered, at least within the limitation of 20 questions. But the system does allow students to see where they might have gone wrong. They may perceive that: the system itself is flawed or incomplete; they abandoned a certain line of questioning too soon; or they asked questions that were imprecise.

Limitations.

There are at least two limitations, not drawbacks, to playing 20Q. First of all, the problem in 20Q only involves discovery. Real world problem solving usually involves more than discovering what is already known. A complete heuristic procedure involves discovery what should be known, as well as what is already known. It should also involve varying perspectives and unusual points of view. The second limitation of 20Q is that the game is a closed system -- once the "hidden" object is discovered the game ends. There is no rhetorical context as there is with a heuristic procedure that is part of the total writing process.

Summary.

If I could summarize the main point of this paper it is that an ideal way to introduce students to heuristic procedures is to have them develop one themselves. I think there are many possibilities, including the one detailed

in this paper. I further believe that calling attention to classifying, sequencing, and questioning promotes adequate initiation to most heuristic procedures. I also believe that the best kind of system to have students develop ought to be put in a problem-solving context (and, ideally, a rhetorical one); ought to involve brainstorming; and ought to be self-contained -- i.e. a procedure for dealing with a specific kind of problem. For example, students could be asked to develop a heuristic procedure for generating ideas for a personal letter. This would involve a problematic and a rhetorical context -- problematic since most students have problems in writing letters (saying something) and rhetorical because they have to consider the audience. Another very simple idea is to have them develop a procedure for recalling a name. We have all been plagued by the "problem" of trying to recall someone's name.

The end result of any of these strategies ought to be the active engagement of students in the process of writing or composing, students who see their minds, character, and humanity as essential for good communication. And, hopefully, students who no longer with ease mark minus when assessing their writing ability.